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EXPERIMENTS WITH OSTRICHES.—VIII.

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EXPERIMENTS WITH OSTRICHES.—VIII.

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As the ostrich industry is comparatively new, and little scientific investigation has hitherto been devoted to it, there are yet many problems in the management of the bird which call for solution; many questions which can only be satisfactorily settled by combining wide experience and intelligent observation. Moreover, the experiences of different farmers are often so diverse that on many points, apparently simple, no reliable conclusion can yet be reached. The questions presented below are brought forward more with the view of stimulating enquiry than as conclusions to be accepted implicitly.

1. The Time Required for the Growth of Short and Long Feathers.

It is usually held that from the time of quilling to the ripening of the next crop of feathers involves a period of six months, and that two more months are necessary before the quills are ripe and ready for drawing. Under these circumstances, the feather requires only eight months for its complete development. A closer investigation, however, reveals that in practice these periods are only approximate, and that much variation, even to the extent of three or four weeks, may occur between the ripening of one crop and that of the next. As is shown below, the question is one of considerable importance to ostrich farmers, but can only be settled by the accumulation of the experience in different districts and under different conditions.

The actual period required is evidently closely connected with the nutritive condition of the bird, and also with the particular strain. Now that so much more attenton is being given to the high feeding of ostriches, particularly by means of lucerne pasturage, birds as a rule are kept in a better condition than formerly. Growth is usually accelerated by high nutrition, and from one's general experience of animals, it would naturally be expected that a bird in a high state of nutrition would grow and ripen its feathers earlier than a bird in a poor or ordinary condition of nutrition. But this would appear to be by no means the usual experience. When the birds are particularly well fed, many farmers are finding that the plumes and quills actually require a longer period than six and eight months respectively in which to ripen.

If the latter be the case, a brief consideration will show that the longer period is by no means a disadvantage. For the longer growth period implies that the feather itself will probably be of greater length, and in these days a longer feather realises a more than proportionately higher price. No farmer would complain of two or three weeks delay in the ripening of the plumes, if thereby the latter were increased so many inches in length, granting, of course, that the tips were not worn nor the lustre diminished.

A single experience will indicate the nature of the results which may be expected. Among a score of chicks were four individuals two or three weeks younger than the rest. All being artificially fed together, the smaller chicks were at a disadvantage throughout, and failed to make the same progress as the others. Yet their spadonas ripened a week or two in advance of those of the other chicks, but were much smaller both in length and in breadth; in fact, among the chicks as a whole, the longer larger plumes were the last to ripen. The blood receded from the pith of the feather more quickly in the somewhat impoverished chicks than in the individuals which were highly nourished, and in the former the spadonas were short, while in the latter they were long.

An isolated experiment of this kind does not prove much; but if the interpretation placed upon it be correct, it is manifest that the matter is one well worthy of enquiry. It will emphasise the great need, now generally recognised, that birds should be kept in a high nutritive state if it is desired to produce large superior feathers. The present note is written with the purpose of eliciting from ostrich farmers their experience of the length of time required for the growth of long feathers, as compared with the time necessary for the growth of short feathers. Most farmers keep written records of their various operations with birds—times of clipping, quilling, etc.—and it should be an easy matter to furnish such data as would be of great value in the solution of the problem.

It can be easily understood where a bird is in a high condition of nutrition that a rich and full supply of blood is distributed to the growing feathers. In such cases the rich blood supply may recede more slowly from the middle pith or medulla of the feather than where a bird is impoverished or even in ordinary condition. The blood receding less quickly from the nutritive medulla will signify that the feather will continue its growth for a longer period; in other words, *the feather in a highly nourished bird may take longer to ripen, but will be increased in length.*

It should be mentioned that some ostrich farmers of high repute find their feathers are ready for clipping actually at six months, and are ready for quilling at eight months precisely; but others again are just as certain that the times must be extended by two or three weeks, or even more. Something must be allowed for the fact that some farmers clip the plumes earlier than others; but allowing for this, there still seem to be differences in the time during which a feather will continue its growth. It is clear that authentic records from a large number of farmers, with notes as to the condition of the bird during the period, would be of great value in such an enquiry. The question can be stated in several ways: (*a*) *Do long feathers require a longer period than short feathers in which to ripen?* (*b*) *If a bird is highly fed, do its feathers take a longer time to ripen, and thereby give a longer plume?* (*c*) *If a bird is impoverished, we know that its feathers are inferior, and at the same time do they ripen earlier?*

2. DOES AN INFERIOR FEATHER-PRODUCING SOCKET EVER REGAIN ITS ORIGINAL POWER?

There is scarcely any more encouraging sight to an ostrich farmer than to find every plume in a wing fully and uniformly developed, and an absence of blanks or irregularities of any kind. But all farmers of experience have noticed that in a crop of feathers from any bird, there are often odd plumes much smaller and inferior, mixed with those of full size. In arranging the clipping for sale, such plumes are generally stuck away in the middle, in the hope that they will not prejudice the value of the bunch as a whole. These odd inferior feathers are more likely to occur in old birds which have been carelessly treated than in young birds which have received proper attention, and if present in any number they seriously depreciate the value of a clipping.

It is generally understood that such odd inferior feathers come from sockets which have been badly treated, usually by having previous feathers trampled out before ripeness, or by having the quills drawn while yet very green. The copious hæmorrhage produced by drawing a quill while still full of blood seems to interfere with the supply of blood to the subsequent feather, and a small inferior plume is the result. In the early days of ostrich farming it was not unusual to pluck the feathers long before the quill was ripe, but it was soon found that the subsequent crops rapidly deteriorated, becoming short and stalky. The practice is now rarely followed, though recently one prominent ostrich farmer reports having got *two crops of feathers*, spadonas and first-after-chicks, from chicks only just twelve months old.

The question has been asked whether these sockets producing odd inferior feathers in one crop ever recover or regain their original power to produce a full-size feather in a later crop. Different opinions have been expressed thereon. Some farmers assert that the sockets do recover their original vigour, while others are very doubtful. Those who hold the former view do not hesitate to pluck a half-grown feather out of time in order to start the next crop evenly, knowing full well that the next feather from the particular socket will be inferior. They consider that the socket recovers in the second crop, and a full feather appears.

An experiment now in progress will throw some light upon the problem. A hen was received some time ago which had apparently been badly treated; some of the feminas were moderately good, but mixed with them were others very short and stalky, and altogether inferior to those which the bird was capable of producing. The plumes have since been clipped, and later the quills were drawn all at the same time, and all fully ripe. The bird is now in excellent condition, and it is proposed to watch her closely to see whether all the feathers of the next crop will be of uniform quality, or whether some will be good and others inferior, as in the last clipping. No doubt, many farmers have had experiences similar to the above, and it is very desirable that they should be placed on record.

3 How far is the Character of the Adult Feather determined by that of the Early Clippings.

This question is very closely associated with the last. All agree that the characteristics of an adult ostrich, as of animals generally, are determined to a large degree by the treatment which the animal receives during its youthful growing period. An animal which has been insufficiently fed and badly treated while young, rarely attains the splendid form of one which has been well fed and properly treated during its growing period. The foundation of an animal is laid down while young, and this largely determines what it will ultimately become; later efforts are not likely to develop superior qualities if the youthful growth has been stunted.

Similarly with feathers. There is every reason for holding that the character of the feather which a bird will continue to produce is mainly determined by that of the first two or three crops. If the growth of the feather is stunted throughout these early crops, it is not probable that recovery will take place, however excellent may be the later treatment. After the third crop, the bird may be considered to have attained maturity, and its feather germs have got into the habit, as it were, of producing a certain size and quality of plume, and no amount of superior treatment will readily modify this fixity.

While the hereditary qualities, or those with which the creature is born, count for a good deal in an animal, and determine in the main what it will become, it has also to be admitted that animals are very plastic in their youth, and that the hereditary tendencies can be encouraged or restrained by the conditions to which they are subject. By high treatment of ostrich chicks the feather growth can be stimulated. and, with this foundation it is easier for the feather germs to continue to produce better feathers than it would be to start superior feather production in birds which had not attained it while young.

It is not urged that the spadonas are an altogether reliable criterion of what the later feathers will be; there are many experiences to the contrary; but it is maintained that in them part of the foundation is laid down which will determine the future clippings. This foundation is continued during the growth of the juvenal feathers and in the growth of the third crop; but from this time on very little advancement can be expected, a greater or less fixity having been reached with maturity. If a good feather has not been produced at the second-after-chicks, it is not likely to be grown afterwards; the feather-producing qualities of each socket have by that time become more or less settled, and both internal and external conditions will have much less effect than before.

It it these considerations which impress one with the great need there is that chicks and young birds should be well treated, and maintained in the best of conditions, even at considerable expense, in order to encourage their feather producing powers to their utmost; for once these have been developed and fixed, there is not the same likelihood they will change either for better or for worse. Even if the size of the adult plume is not determined by that of the spadona, it certainly is by that of the juvenal and second-after-chick. To get the best the bird can produce, the effort must be made from the beginning.

Experience has proved, however, that an adult bird usually producing good feathers may occasionally give rise to a crop altogether inferior. Especially after an exceptionally good clipping it is sometimes found, for no reason which has yet been determined, that the next crop is almost valueless. A marked case is that shown in the photopraph (Fig. 1). The clipping previous to the one from which the feather was obtained consisted of good plumes, and, although the bird apparently continued in the same condition of health, yet all the feathers were of the same worthless character as that here shown. It is obvious there must have been some difference in the featherproducing vigour of the bird during the growth of the two crops, but without having the bird under observation it would be impossible to say in what the difference consisted. Granted that the bird was in the same condition of health on both occasions one can only surmise some seasonal or sexual influence had reduced its physiological vigour.

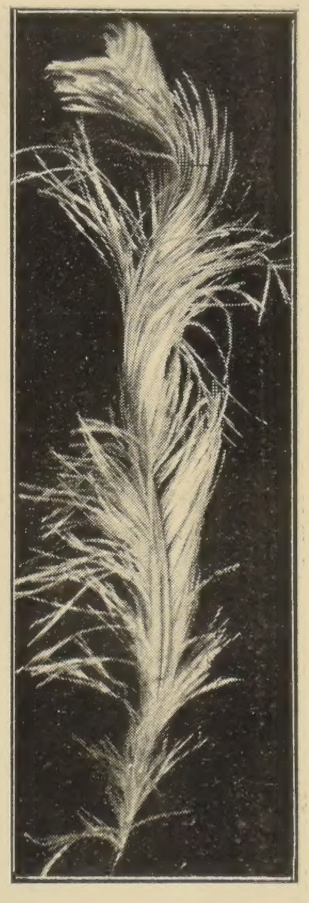

Fig. 1.—An inferior twisted feather, one of a complete clipping, grown by a bird which usually produces superior feathers.

Some farmers consider that a nervous or excitable bird may be chased about to such a degree and so roughly handled at the time of clipping that its system does not recover from the shock for two or three months afterwards. It is therefore possible that in some instances rough handling during quilling is the explanation of an inferior crop of feathers. If so, it would emphasise the need for care in the handling of birds, and also for keeping the birds as tame as possible. The more frequently ostriches are collected and examined the less wild do they become. The explanation of rough handling would scarcely apply to cases where a whole flock produces an unusually inferior clipping; a farmer is not likely to handle his flock more roughly at one time than at another, while with odd birds this may be the case.

The spiral nature of the sample feather here shown is such as one usually considers to result from careless quilling, but a suggestion of this nature could not be associated with such progressive farmers as Messrs. Rayner and Roberts, Tarka Bridge, from whom the feathers were obtained, particularly as all the feathers on both wings were of the same inferior type. In such a case there is every probability that the germs in the sockets have the power of recovery, and that the next clipping will consist of full perfect feathers. In connection with spiral plumes it may be mentioned that such often seem to result from feathers which in the process of growth do not properly overlap one another and thereby keep one another flat. Odd feathers, growing out of time, are frequently spiral through not having others adjacent to them.

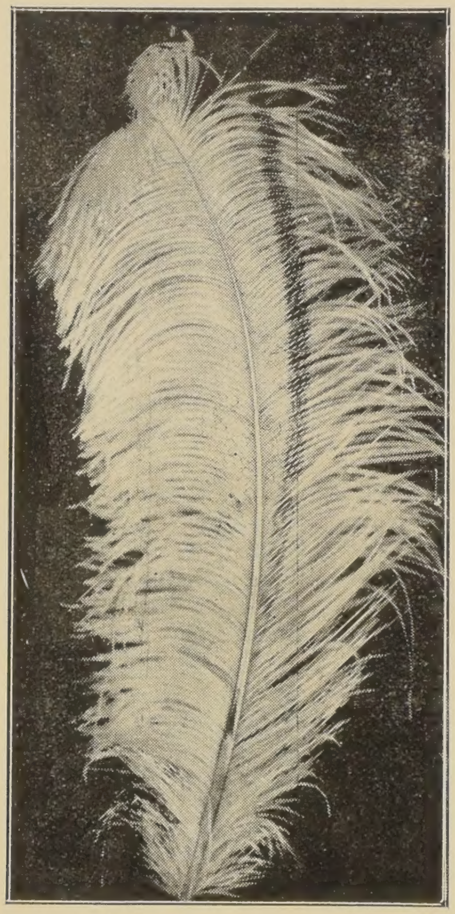

Fig. 2.—A plume with a broad longitudinal defect or vertical bar on one side. This is the third feather of the kind produced from the same socket.

4. An Injured Socket Continues to Produce Malformed Feathers.

Among the number of whites or feminas met with on an ostrich are frequently found single plumes which are malformed, and consequently more or less valueless. Sometimes the feather from the one socket will be split into two imperfect feathers, or a rod-like growth may grow along with a more or less normal feather; Mr. Hougham Abrahamson, of Hougham Dale, has recently sent such a freak feather in which three imperfect plumes have grown together from a single socket. A more familiar defect, however, is one in which the feather throughout its length exhibits an irregularity in the flue like that shown in the photograph (Fig. 2). Such defects are sometimes described as vertical or longitudinal bars, but it must be understood they have no connection whatever with the more prevalent cross bars which are produced by constrictions round the growing feather.

All these malformed or freak feathers are due to some injury to the feather germ by which the parts of the feather are not formed in the regular manner. In the case of two or three imperfect feathers from one socket it may be assumed that the feather germ has been torn or divided into two or three parts, and an incomplete feather comes from each part. The vertical bar may be compared with the longitudinal ridges or grooves often found on one's nails, and which are due to some injury to the bed of the nail in the region of the new growth.

The feather photographed was obtained from Messrs. Rosenbaum, Lax & Co., Grahamstown, having been grown by Mr. J. Alban Gardiner, Stapelford, Kendrew, and its special interest lies in the fact that the same socket always produces a feather with a longitudinal bar. In fact three consecutive feathers (1906 to 1908) have now been obtained all from the same socket, and all show a like defect. This and similar instances seem sufficient to justify us in the conclusion that a feather germ or socket once injured, either accidentally or by careless quilling, will probably never recover, but continue to grow a malformed feather with each crop.

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